AD-A051 097 FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO F/G 14/2
SUBSECTION OF PROCESSES AND APPARATUSES OF CHEMICAL TECHNOLOGY --ETC(U)
AUG 77 A I VOLKIND, E Y TARAT, V K ABRAMYAN
UNCLASSIFIED FTD-ID(RS)T-1345-77 NL

1 OF 1
ADA
051097

END
DATE
FILMED
4 -78
DDC

AD-A051097

1

FTD-ID(RS)T-1345-77

FOREIGN TECHNOLOGY DIVISION

AIR FORCE SYSTEMS COMMAND

SUBSECTION OF PROCESSES AND APPARATUSES OF CHEMICAL TECHNOLOGY
(SELECTED ARTICLES)

FOREIGN TECHNOLOGY DIVISION

EDITED TRANSLATION

FTD-ID(RS)T-1345-77 12 August 1977

MICROFICHE NR: FTD-77-C-001044

SUBSECTION OF PROCESSES AND APPARATUSES OF CHEMICAL TECHNOLOGY (SELECTED ARTICLES)

English pages: 6

Source: Nauchno Tekhnicheskaya Konferentsiya Podsektsiya Proisessov i Apparatov Khimicheskoy Tekhnologii (Sekisiya Khimicheskoy Tekhniki i Obshchlinzhenernykh Distsiplin), 1973, PP. 34-35, 39, 56

Country of origin: USSR
Translated by: Bernard L. Tauber
Requester: FTD/PHE
Approved for public release; distribution unlimited

PREPARED BY:

TRANSLATION DIVISION
FOREIGN TECHNOLOGY DIVISION
WP-AFB, OHIO.

TABLE OF CONTENTS

U. S. BOARD ON GEOGRAPHIC NAMES TRANSLITERATION SYSTEM

Block	Italic	Transliteration	Block	Italic	Transliteration
А а	*А а*	A, a	Р р	*Р р*	R, r
Б б	*Б б*	B, b	С с	*С с*	S, s
В в	*В в*	V, v	Т т	*Т т*	T, t
Г г	*Г г*	G, g	У у	*У у*	U, u
Д д	*Д д*	D, d	Ф ф	*Ф ф*	F, f
Е е	*Е е*	Ye, ye; E, e*	Х х	*Х х*	Kh, kh
Ж ж	*Ж ж*	Zh, zh	Ц ц	*Ц ц*	Ts, ts
З з	*З з*	Z, z	Ч ч	*Ч ч*	Ch, ch
И и	*И и*	I, i	Ш ш	*Ш ш*	Sh, sh
Й й	*Й й*	Y, y	Щ щ	*Щ щ*	Shch, shch
К к	*К к*	K, k	Ъ ъ	*Ъ ъ*	"
Л л	*Л л*	L, l	Ы ы	*Ы ы*	Y, y
М м	*М м*	M, m	Ь ь	*Ь ь*	'
Н н	*Н н*	N, n	Э э	*Э э*	E, e
О о	*О о*	O, o	Ю ю	*Ю ю*	Yu, yu
П п	*П п*	P, p	Я я	*Я я*	Ya, ya

*ye initially, after vowels, and after ъ, ь; e elsewhere. When written as ё in Russian, transliterate as yё or ё. The use of diacritical marks is preferred, but such marks may be omitted when expediency dictates.

GREEK ALPHABET

Alpha	Α α α		Nu	Ν ν	
Beta	Β β		Xi	Ξ ξ	
Gamma	Γ γ		Omicron	Ο ο	
Delta	Δ δ		Pi	Π π	
Epsilon	Ε ε ϵ		Rho	Ρ ρ ϱ	
Zeta	Ζ ζ		Sigma	Σ σ ς	
Eta	Η η		Tau	Τ τ	
Theta	Θ θ ϑ		Upsilon	Υ υ	
Iota	Ι ι		Phi	Φ φ ϕ	
Kappa	Κ ϰ κ ϰ		Chi	Χ χ	
Lambda	Λ λ		Psi	Ψ ψ	
Mu	Μ μ		Omega	Ω ω	

RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English
sin	sin
cos	cos
tg	tan
ctg	cot
sec	sec
cosec	csc
sh	sinh
ch	cosh
th	tanh
cth	coth
sch	sech
csch	csch
arc sin	$\sin^{-1}$
arc cos	$\cos^{-1}$
arc tg	$\tan^{-1}$
arc ctg	$\cot^{-1}$
arc sec	$\sec^{-1}$
arc cosec	$\csc^{-1}$
arc sh	$\sinh^{-1}$
arc ch	$\cosh^{-1}$
arc th	$\tanh^{-1}$
arc cth	$\coth^{-1}$
arc sch	sech^{-1}
arc csch	csch^{-1}

Russian	English
rot	curl
lg	log

GRAPHICS DISCLAIMER

All figures, graphics, tables, equations, etc. merged into this translation were extracted from the best quality copy available.

A DEVICE TO STUDY THE EFFECT OF PRELIMINARY ELECTRIFICATION OF AN AEROSOL ON THE EFFECTIVENESS OF WET DUST TRAPS

A. I. Volkind, E. Ya. Tarat, V. K. Abramyan, L. N. Reutovich

Department of Catalyst Technology, LenNIIgiprokhim [Leningrad Scientific Research Institute of the State Institute on Planning Plants for the Basic for Chemical Industry]

The trapping of dust particles less than 5 μm in size occurs unsatisfactorily even in such an effective dust trap as a foam apparatus. An increase in the effectiveness of the dust trap can be obtained by enlarging the particles, ordering their motion, and increasing the kinetic energy in the field of the corona discharge. This is achieved in our unit by combining the needle-shaped corona electrodes with a precipitating electrode which is permeable to gas in the form of a grounded lattice which carries a gas-liquid layer. The basic parts of the unit are the foam apparatus with an output of up to 40 cubic meters per hour for gas and replaceable electrification chambers with a diameter of from 50 to 280 mm of various designs with a corona needle-shaped electrode. The discharge of the aerosol particles by ions which are formed in the zone of the corona discharge (electrification of the aerosol) occurs in the chamber.

By preceding research it was established that the efficiency of the foam apparatus varies from 96% without electrification to 97.4% with electrification with a dust content of 1 gram per

cubic meter for dust of phosphate fertilizer of average dispersion. The employment of electrification proves to be especially effective for finely-dispersed aerosols. At the present time, studies are being conducted with the purpose of disclosing the effect of the electrification of the aerosol on the fractional efficiencies of the dust trap and the optimization of the design of the chamber and increasing its output by increasing the speed of the gas.

STUDY OF THE DISPERSIVE COMPOSITION OF A CARBON-BLACK AEROSOL DURING COAGULATION

V. M. Shopin, V. V. Suponev, and V. P. Isakov

The Department of Optimization of Chemical and Biotechnological Equipment. The All-Union Scientific Research Institute of the Carbon Black Industry

For an analysis of the effectiveness of coagulation of a carbon-black aerosol at various stages of its life, a procedure has been developed for determining the dispersive composition of carbon-black aggregates in a high-temperature flow with the use of a dust dispersion rotary analyzer created by the NIIOGAZ [State Scientific Research Institute for Commercial and Sanitary Purification of Gas].

The following are envisioned to ensure precision of the analysis: the dilution of the aerosol being analyzed by an inert gas; ensuring the constancy of the aerosol temperature in the sampler and in the analyzer rotor; accomplishment of the capabilities of the aerosol sampler for 20 s or more.

It was established that the median size of the carbon-black aggregates in front of the condenser does not exceed 1 μm, prior to precipitation on a filter is 10-20 μm, and in the centrifugal field of the coagulator reaches 60-150 μm.

In the condensor with the sprinkling of the aerosol with finely atomized water, favorable conditions are created for the coagulation of carbon-black particles in a field of centrifugal forces.

EXPERMIMENTAL DETERMINATION OF THE DIFFUSION COEFFICIENT IN CHARGERS OF A WET DUST-TRAPPING SYSTEM WITH PRELIMINARY ELECTRIFICATION

I. N. Kots, A. I. Volkind, V. K. Abramyan, and E. Ya. Tarat

Department of Catalyst Technology, Department of Automatic Control Systems

In systems of wet dust trapping with preliminary electrification of the aerosol particles, a certain advantage is possessed by a charger of a corona charge with electrode shape of the needle - coaxial cylinder type. Knowledge of the diffusion coefficient of the ions is necessary for the design of such devices. The diffusion coefficient was determined indirectly from the formula

$$\frac{n_1}{n_2} = e^{-\frac{C_1 D_i (L_2 - L_1)}{d^2 v}}$$

where: n_1, n_2, units/m^3 - the concentration of ions in the axial direction at a distance of L_1, L_2 from the corona needle, meters; D_i - the diffusion coefficient, m^2/s; C_1 - the known constant ~ 3.6; v, m/s - the speed of the dust-gas flow; d, m - the internal diameter of the charge chamber. Chargers with an internal diameter of the charged chambers of 0.5 and 0.25 meters made from steel and 0.045 m made from steel, plastics, and ceramics were used. Measurements of the ion concentration were accomplished with rates of the dust-gas flow of 1, 2, 3, 4, and 11.5 m/s at points at a distance in an axial direction from the end of the corona needle

of 0.02, 0.1, 0.2, 0.3, 0.4, 0.5, and 0.6 meters. It was established that the diffusion coefficient of the ions increases with an increase in the rate of flow and the diameter of the tube in the charging chamber. The value of D_i decreases if the tubes of the charging chambers are made from dielectrical materials. The diffusion of the ions in a charger of the needle-coaxial cylinder type is virtually independent of the corona current value.

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE

READ INSTRUCTIONS BEFORE COMPLETING FORM

1. REPORT NUMBER FTD-ID(RS)T-1345-77	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) SUBSECTION OF PROCESSES AND APPARATUSES OF CHEMICAL TECHNOLOGY (SELECTED ARTICLES)		5. TYPE OF REPORT & PERIOD COVERED Translation 6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s)		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Foreign Technology Division Air Force Systems Command U. S. Air Force		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS		12. REPORT DATE 1973 13. NUMBER OF PAGES 6
14. MONITORING AGENCY NAME & ADDRESS(if different from Controlling Office)		15. SECURITY CLASS. (of this report) UNCLASSIFIED 15a. DECLASSIFICATION/DOWNGRADING SCHEDULE

16. DISTRIBUTION STATEMENT (of this Report)

Approved for public release; distribution unlimited

17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)

18. SUPPLEMENTARY NOTES

19. KEY WORDS (Continue on reverse side if necessary and identify by block number)

ACCESSION for		
NTIS	White Section	X
DDC	Buff Section	
UNANNOUNCED		
JUSTIFICATION		
BY		
DISTRIBUTION/AVAILABILITY CODES		
Dist.	AVAIL. and/or SPECIAL	
A		

20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

11;20;07

DD FORM 1 JAN 73 1473 EDITION OF 1 NOV 65 IS OBSOLETE

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

DISTRIBUTION LIST

DISTRIBUTION DIRECT TO RECIPIENT

ORGANIZATION		MICROFICHE
A205	DMATC	1
A210	DMAAC	2
B344	DIA/RDS-3C	8
C043	USAMIIA	1
C509	BALLISTIC RES LABS	1
C510	AIR MOBILITY R&D LAB/FIO	1
C513	PICATINNY ARSENAL	1
C535	AVIATION SYS COMD	1
C557	USAIIC	1
C591	FSTC	5
C619	MIA REDSTONE	1
D008	NISC	1
H300	USAICE (USAREUR)	1
P005	ERDA	1
P055	CIA/CRS/ADD/SD	1
NAVORDSTA (50L)		1
NASA/KSI		1
AFIT/LD		1

ORGANIZATION		MICROFICHE
E053	AF/INAKA	1
E017	AF/RDXTR-W	1
E404	AEDC	1
E408	AFWL	1
E410	ADTC	1
E413	ESD	2
	FTD	
	CCN	1
	ETID	3
	NIA/PHS	1
	NICD	5